

PEGGY R. BIGA

ASSOCIATE PROFESSOR
GRADUATE PROGRAM DIRECTOR
University of Alabama at Birmingham | Department of Biology
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EDUCATION

- 1999-2003 Doctor of Philosophy, University of Idaho, Moscow, ID, Nutritional Physiology
Dissertation: *The effects of recombinant bovine somatotropin on growth-related genes in rainbow trout (Oncorhynchus mykiss)*. Mentor: *Gerald T. Schelling (d. 2001), Troy L. Ott*
- 1997-1999 Master of Science, Angelo State University, San Angelo, TX, Nutrition. Mentor: *Brian J. May*
- 1993-1997 Bachelor of Science, Angelo State University, San Angelo, TX
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PROFESSIONAL EXPERIENCE

2023 – present Graduate Program Director, UAB Department of Biology

As the GPD, I serve as the main departmental contact with the CAS Dean's Office and the UAB Graduate Dean's Office in relation to the departmental graduate program. As director of the graduate program, I also serve as the Chair of the Graduate Affairs and Curriculum Committee which operates to review graduate student applications annually and reviews program operations. Graduate Program operations include final decisions on admission, awarding of Graduate Teaching Assistantships or Blazer Funding, and communication of these decisions to relevant faculty and students. As GPD, I also work with the Instructional Laboratory Supervisor and Department Chair to assign graduate student teaching assignments. I also organize and manage the monitoring of graduate student progress toward their appropriate degree.

2019 - present Associate Professor (with Tenure), UAB Department of Biology

Since promotion to Associate Professor, my research program has expanded to focus on mechanistic studies of sex-specific aging with particular focus on dimorphic growth in fishes. Much of the work in my research lab has shifted to working with *Xiphophorus* species, as they provide diverse sexually dimorphic phenotypes in growth and aging phenotypes. This work is part of two NSF grant proposals: one large Biology Integration Institute grant (IISAGE) that was recently funded, and one NSF IntBIO grant current in review. Additionally, my research lab continues to focus on parental dietary influence via epigenetics on offspring growth and metabolic physiology (USDA funded, 2018-2022; 2023-2028). During this time, I have mentored 5 doctoral and 1 Master's students, as well as 10 undergraduate researchers, 2 postdoctoral scientists, 2 high school students, published 6 peer-reviewed articles (with 4 in preparation), 1 invited book chapter in review, contributed 2 blog posts, obtained a prestigious AAAS Science Policy fellowship, and obtained one NSF Biology Integrative Institute (BII) grant and one USDA NIFA grant.

2019 - 2021 Science and Technology Policy Fellow, American Association for the Advancement of Science, USDA Chief Scientist Office, Washington, DC

As a Science & Technology Policy Fellow, my portfolio covered STEM education, Crowdsourcing and Citizen Science, and Food and Nutrition. I developed and managed, in response to a General Accountability Office (GAO) report on Nutrition Education, a USDA Nutrition Promotion Working Group with the mission to coordinate science and implementation of nutrition education and promotion across the USDA. I also worked on high level messaging on nutrition and health briefings and reporting for

both the USDA Chief Scientist and the USDA Secretary. During this period, I wrote 2 blog posts, contributed to 4 major Federal reports (STEM Education Strategic Plan, Executive Order, R&D Infrastructure Strategic Plan, Crowdsourcing and Citizen Science Report), co-authored 1 USDA white paper (Aquaculture is Agriculture), provided talking points on several key issues (nutrition, STEM education, blockchain, and citizen science activities), hosted 2 major workshops (Aquaculture is Agriculture, Nutrition Promotion across USDA), and provided input on future AgARDA program planning.

2012 - 2018 Assistant Professor, UAB Department of Biology

As an Assistant Professor at UAB, I further established my research program in comparative muscle biology, set up warm- and cold-water fish rearing facilities at UAB, mentored 1 Master's, 4 Doctoral, supervised 45 undergraduate, 2 high school researchers, and 1 post-bachelorette student, graduated 4 graduate students, published 19 peer-reviewed papers, and obtained a competitive USDA AFRI research grant and an NIH conference grant.

2007 - 2012 Assistant Professor, North Dakota State University, Department of Biological Sciences, Fargo, ND

As an Assistant Professor at NDSU, I established my research program in comparative muscle biology, set up warm-water fish rearing facilities at NDSU, mentored 1 Master's and 2 Doctoral students, supervised 26 undergraduate researchers, graduated 1 graduate students, published 8 peer-reviewed papers, 1 book chapter, and obtained an NIH R03 research grant.

2005 - 2007 Assistant Scientist, University of Wisconsin-Milwaukee, Great Lakes WATER Institute, Milwaukee, WI

As an assistant scientist at UWM, I established the comparative biology aspect of my research program while maintaining work in aquaculture with yellow perch. I was a co-PI on a Wisconsin Sea grant award focusing on the establishment of yellow perch broodstock in Wisconsin to aid the developing industry. During this time, I published 3 peer-reviewed papers and received one NIEHS internal grant.

2004 - 2005 Research Associate, University of Wisconsin-Milwaukee, Great Lakes WATER Institute, Milwaukee, WI; Mentor: Frederick 'Rick' Goetz

As research associate, I worked under the mentorship of Dr. Rick Goetz to validate the comparative models of muscle growth, while studying the mechanisms of myostatin action in fishes.

2003 - 2004 Postdoctoral Scientist, Marine Biological Laboratory, Woods Hole, MA; Mentor: Frederick 'Rick' Goetz

I was awarded a prestigious USDA Postdoctoral grant to train under the mentorship of Dr. Rick Goetz to validate the zebrafish and giant danio as comparative models for understanding muscle growth dynamics.

OTHER POSITIONS HELD

2022 - present Science Policy Graduate Certificate Program Director, UAB

Duties include interacting with the graduate school and the Interdisciplinary graduate Studies program staff to coordinate certificate functions. As program director I review student applications, meet with prospective and active students, recruit new students and faculty, track enrollment, follow student progress, coordinate course offerings and approvals, and advertise the program. This program had its first 2 graduates in December 2022.

- 2022 – present Chair of the UAB Faculty Senate Research Committee, Member Faculty Senate Executive Committee**
 In this role, I coordinate monthly meetings of the RC, develop meeting agendas, prepare meeting minutes, and serve as liaison to the Dean Research Council, Council of Center Directors, and to the UAB Human Research Advisory Council. As RC Chair, I serve as a mechanism to facilitate improved communication between UAB faculty, the Faculty Senate, and the Council for Center Directors, the UAB Research Advisory Council and the Research Council with the goals of improving research effectiveness and breaching barriers. I attend meetings held by councils, the Faculty Senate, and I meet with the VP for Research monthly. Additionally, I serve on several taskforces (IDC Sharing and Data Sharing and Management) and administrative search committees (Associate VP for OSP).
- 2021 - 2023 UAB Blazer Core Faculty Fellow, Class of 2023**
 The Blazer Core Faculty Fellows program allows faculty engaged in the core curriculum the opportunity to explore innovative and impactful pedagogy within their teaching. The fellowship provides feedback on teaching and opportunities for development and training related to impactful teaching. I am partnered with Krista Chambliss (Foreign Languages) for peer-review of teaching.
- 2021 – 2022 Senator-at-Large, UAB Faculty Senate Executive Committee**
 The FSEC is a body of senior faculty leaders from all campus units that directly interfaces with the Offices of the President and Provost and provides input and feedback on the emerging campus initiatives and burning faculty issues. FSEC meets twice a month to develop the Faculty Senate meeting agendas and discuss current affairs with senior University leadership.
- 2021 – 2022 Member of the UAB Faculty Senate Research Committee**
 The RC of the FS is responsible for reviewing matters and recommending policy pertaining to research and to the environment and the dissemination of research knowledge. Specific matters for review and advice include research and service programs, both existing and proposed and existing policies and procedures which may affect the environment for research and the dissemination of research knowledge.
- 2021 – present Faculty Senate Representative, Institutional Biosafety Committee**
 The IBC is charged with the review and approval of all research (regardless of funding) involving recombinant or synthetic nucleic acid research as non-exempt by the NIH Guidelines, all research involving agents capable of causing illness in people (designated Risk Group 2 and above), and all work involving the use of toxins. The IBC reports to the VP for Research and meets monthly to review and discuss proposed research activities, review training, facilities and facility modification, standard operating procedures, trends in biosafety and biosecurity, etc. In this role, I serve as liaison to the IBC from the Faculty Senate.
- 2021 – present Member of the UAB Faculty Senate**
 The Faculty Senate represents UAB's faculty in matters of shared governance. Through participation in various councils and committees, the FS convey the faculty's views and concerns in matters that affect our University.
- 2018 – present Co-Leader Alabama Scholars Strategy Network (AL-SSN)**
 Working with Dr. Pete Jones (UAB), Dr. Bridgette King (Auburn), and Dr. Maura Mills (UA), we lead the Alabama chapter of the Scholars Strategy Network, a federated network of scholars with a mission of building relationships between academic scholars and policy makers, while also working with policymakers to ensure policy decisions are driven by data. As leaders of AL-SSN we organize monthly chapter meetings, training

workshops, networking meetings, and organize research projects. In addition, we manage an annual budget that covers meetings, as well as pilot research projects. Our recent work includes a partnership with Alabama Appleseed that led to a memo being distributed to Alabama legislators that included data related to State money wasted related to suspension of licenses that was used to stop a bill this past session.

<https://scholars.org/scholar/peggy-bigga>

2020 – present Editorial Board Member, Marine Biotechnology

As an editorial board member, I provide quality assessment and critical evaluation of papers, serve as an ambassador for the journal by promoting it within the scientific community, and assist the Editor-in-Chief and Associate Editors-in-Chief support.

<https://www.springer.com/journal/10126/editors>

UAB CENTER APPOINTMENTS

January 2023	Associate Scientist, Social Science and Justice Research, UAB
January 2017	Scientist, Global Center for Craniofacial, Oral and Dental Disorders, UAB
May 2016	Associate Scientist, Comprehensive Diabetes Center, UAB
October 2015	Scientist, Comprehensive Center for Healthy Aging, UAB
August 2012	Associate Scientist, Nutrition Obesity Research Center, UAB

RESEARCH INTERESTS

My research program is quite diverse in projects but holds an overall focus on the mechanisms regulating organismal growth, with particular interest in continuous muscle growth and age-related atrophy. Skeletal muscle is a unique tissue as it provides both structure and function for organisms, is multinucleated, and is extremely metabolically demanding. Naturally, we have organized muscle growth into two categories: determinate and indeterminate. Humans exhibit a determinate growth type where we essentially have a set number of muscle fibers throughout our lifetime. These fibers can become larger (hypertrophy) and be replaced if damaged (hyperplasia), but an increase in fiber numbers doesn't really happen after sexual maturity. However, in many organisms, like most fishes, the number of muscle fibers can increase through their lifetime (indeterminate growth). As the pathways regulating muscle development and growth are highly conserved across taxa, my lab is working to unravel what mechanisms allow for continued hyperplasia.

For the past 18 years, I have led an effort to identify novel mechanisms regulating muscle growth, with particular interest in the growth hormone-insulin like growth factor (GH-IGF) system, myostatin, and myogenic transcription factors like pax3 and pax7. My lab has demonstrated *unique interactions between the GH-IGF system and myostatin regulation in indeterminate growing species*, where GH positively regulates myostatin in muscle of determinate growing fish while the opposite is observed in indeterminate growing fish. Additionally, we have demonstrated that myostatin expression in fish is more complex than observed in mammals and likely regulates energy partitioning as a mechanism of muscle growth regulation. We also first identified a *unique expression pattern of pax3 that appears to be related to a maintained fetal stem-like phenotype that last longer in muscle satellite cells in indeterminate growing fish muscle and likely allows for continued hyperplastic growth even after sexual maturity*. This work was funded by USDA and NIH NIAMS, and we are currently working in collaboration with Dr. Jean-Charles Gabillard (INRA, Rennes, France) to further validate the role of pax3 and the unique regulation and mechanism of action of myostatin in indeterminate growing fish.

More recently, we have begun to focus on Poeciliid fishes, as several species exhibit sexually dimorphic growth patterns, where one sex grows larger and faster than the other and this growth resembles indeterminate growth. The opposite sex appears to exhibit determinate muscle growth, thus providing a valuable comparative model system within individual species. In fact, Poeciliid fishes are so diverse in their phenotypes, that in some species the females grow larger and faster than the males, while in other species the male grows larger and faster than the females. Also, some species do not exhibit sexually dimorphic growth at all. Specifically, *Xiphophorus* species provide us with a unique opportunity to evaluate highly related growth regulating pathways in divergent phenotypes. In addition, these growth characteristics are also highly correlated to aging phenotypes, where faster growing individuals tend to live shorter lives compared to slower growing counterparts. *Xiphophorus* species exhibit sexually dimorphic aging phenotypes as well, with as much and overlapping variation as we see in growth dynamics. Our work with Poeciliid fishes is part of a large multi-institution Biology Integration Institute (BII: IISAGE) project I am co-PI on that was recently funded through an NSF contract. My role in IISAGE related to research includes all things fish, where we will compare multiple *Xiphophorus* species (male, female, old, young) aging phenotypes in relation to numerous sexually dimorphic phenotypes (like growth). Additionally, we will test any mechanisms identified in medaka, as *Xiphophorus* are live-bearing fish while medaka are closely related but more amenable to genetic manipulations. I also serve as the Director for the Outreach portion of IISAGE, where I will lead a Citizen Science Project that engages pet hobbyists from across the world in collecting key data sets from fish and reptiles, we don't have immediate or consistent access to in a research setting. My lab is also collaborating with Dr. Mike Sandel (Mississippi State University) and Dr. Zach Culumber (University of Alabama in Huntsville) to understand the contribution of sex-linked genes to variation in growth and aging in *Xiphophorus* sp. with particular interest in the *Mc4r* gene that is related to age at maturity and overall body size. This work is included in a collaborative grant proposal currently in review with NSF IntBIO.

In collaboration with Dr. Beth Cleveland (USDA, National Center for Cool and Cold-Water Aquaculture, ARS, Leetown, WV) we have demonstrated that *supplementation of maternal (broodstock) diets with choline and/or methionine results in enhanced offspring performance*. We have been funded by USDA AFRI to analyze the mechanisms of maternal transfer of growth regulation and have published one peer-reviewed article, with one currently in preparation and 3 outlined. Recent USDA AFRI funding that starts April 2023 adds evaluating parental hypoxia exposure with and without dietary supplementation effects on offspring hypoxia tolerance to our previous nutritional programming work. This work is also tightly related to our work on methionine restriction and metabolic regulation. Interestingly, any intervention that can be used to enhance growth performance in an animal production system (i.e., methionine supplementation), the exact opposite (i.e., methionine restriction) likely leads to improved metabolic regulation and health span. Using this to our advantage, we can use the same research animals to evaluate both interventions and outcomes. We have published 3 key peer-reviewed articles that have identified novel miRNAs regulated by methionine availability, as well as histone modification regulation of autophagy-related genes in muscle. Much of this work has been the groundwork for our expanded research focus on age-related growth phenotypes.

My lab also continues to lead the way in demonstrating conserved and unique actions of teneurin C-terminal associated peptide (TCAP) in fish muscle metabolism and function. We published the first report detailing *TCAP-3 action in regulating metabolic activity and stress responses in zebrafish*. This work also led to the validation of a sensitive, non-toxic, and inexpensive assay for measuring metabolic activity. We continue to work with Dr. David Lovejoy (University of Toronto) in pioneering our understanding of endogenous mechanisms of action of TCAP in fish.

GRANT SUPPORT**Funded Extramural Grants**

- 2023-2028 USDA, NIFA “Just Keep Gilling: Dietary and genetic strategies to improve hypoxia tolerance in rainbow trout” (PI: P. Biga, Co-PI: B. Cleveland), total of \$650,000 to UAB (\$25,000 subaward), awarded, start date: 04/1/2023, current
- 2022-2027 NSF “BII: Integration Institute: Sex, Aging, Genomics, and Evolution (IISAGE)” (PI: N. Riddle, Co-PI: P. Biga), total of \$12,500,000 to UAB (\$8,505,310 in subawards to other institutions; \$765,000 to PB), current
- 2018-2023 USDA AFRI 2018-67015-27478 “Improving rainbow trout growth performance through optimization of diet-epigenetic interactions.” (PI: P. Biga), total \$500,000, current, in NCE
- 2019-2021 AAAS, AWD-000525994 “Science & Technology Policy Fellowship” (PI: P. Biga), total \$236,699, completed
- 2019-2020 Faculty Development Grant, UAB. “Diet-epigenetic interactions regulating transgenerational zebrafish growth.” (PI: P. Biga), total \$10,000, completed
- 2016-2017 National Institutes of Health, Office of Research Infrastructure Programs, R13OD021974. “The 8th Aquatic Models of Human Disease Conference.” (PI: P. Biga), total \$10,000, completed
- 2009-2012 National Institutes of Health, National Institute of Arthritis and Musculoskeletal and Skin Diseases, R03AR055350. “A comparative approach to evaluate muscle growth in an indeterminate growth model.” (PI: P. Biga), total \$214,500, completed
- 2006-2009 Wisconsin Sea Grant. UWM, “Development of Yellow Perch Broodstocks for Selective Breeding.” (Co-PI), total \$342,934, completed
- 2004-2005 USDA-NRICGP. Post-Doctoral Grant, Marine Biological Laboratory, Woods Hole, MA. “The zebrafish (*Danio rerio*) and giant danio (*Danio aequipinnatus*) as models for studying determinate and indeterminate growth in fish.” (PI: P. Biga), total \$89,000, completed

Pending Extramural Grant Proposals:

1. “RaMP: A4Alabama: Strengthening and diversifying the regional STEM workforce through engaging research tackling a changing biological world in social context.” (NSF, RaMP-Res & Mentoring Posbac, 2023-2027, total budget \$2,999,111, PI: P. Biga), *submitted, pending*
2. “IntBIO: Collaborative Research: Supergene stoichiometry: Viviparous fishes as a model for understanding non-mendelian determinants of growth, puberty, and aging” (NSF, IntBIO, 2023-2028, total budget \$2.4M, PI: Sandel, Co-PI Biga; \$594,922 to Biga), *submitted, pending*
3. “Integrated Research Approaches for Improving Production Efficiency in Rainbow Trout” (USDA, Climate Change Initiative: FY22 Funding Cycle, total budget \$500,000, PIs: B. Cleveland, P. Biga, T. Leeds), *submitted, pending*

Recent Extramural Grant Proposals (2019-present; Not Funded):

1. “Just Keep Gilling: Dietary and genetic strategies to improve hypoxia tolerance in rainbow trout” (USDA AFRI, 2023-2028, total budget \$650,000, PI: P. Biga, Co-PI: B. Cleveland), *submitted August 2021, ranked “High Priority”, not funded*
2. “STEAM-con: Developing convergent STEAM curricula to prepare students for the challenges of the 21st century” (NSF DUE-IUSE-Engaged Student Learning: Level III, 2022-2027, total budget \$1,307,762, PI: P. Biga), *submitted July 2021, ranked “Good”, not funded*
3. “Genomics Underlying Piscine Invasiveness (GUPI): The Feral Guppy as an Emerging Model for Adaptive Physiology, Behavior, and Morphogenesis.” (NSF, EPSCoR Track II, 2020-2023. Total budget \$4,385,106; UAB-\$1,526,862) (Co-PI), ranked *Very Good, not funded*
4. “BII: Integration Institute: Sex, Aging, Genomics, and Evolution (IISAGE)” (NSF, total budget \$12.5M, PI: N. Riddle, Co-PI: P. Biga), *submitted 2020, not funded*

5. "Transgenerational effects of parental choline intake on offspring metabolic and cardiovascular health via epigenetic mechanisms" (Egg Nutrition Center, Letter of Intent, total budget \$300,000, 3 years, PIs: P. Biga & S. Turkmen), *submitted 2021, not invited*
6. "Identifying cell-specific genomic instability changes in aged muscle of male female fish and flies" (San Diego Shock Center Pilot Grant Program, total budget \$15,000, PI: P. Biga, Co-PI: N. Riddle), *submitted 2021, not funded*
7. "Evaluating the effectiveness of an Inclusive, Integrative Education Implementation in STEM and non-STEM CAS classrooms on increasing student sense of belonging and STEM literacy" (CAS Interdisciplinary Grant Program, total budget \$30,000, PI: P. Biga), *submitted 2021, not funded*
8. "Epigenetic effects on metabolic physiology: testing the role of parental diet" (NSF IOS, total budget \$584,488, PI: P. Biga, Co-PI: S. Turkmen), *submitted 2021, not funded*

Funded Internal Grants

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| 2019-2020 | Faculty Development Grant, UAB. "Diet-epigenetic interactions regulating transgenerational zebrafish growth." (PI: P. Biga), \$10,000, completed |
| 2016-2017 | Faculty Development Grant, UAB. "The characterization of novel growth hormone signaling regulating indeterminate myogenesis." (PI: P. Biga), \$10,000, completed |
| 2016- 2017 | Nathan Shock Center, UAB. "Long-term treatment with Teneurin C-terminal Associated Peptide (TCAP) improves metabolic efficiency and aging pathologies by regulating glucose metabolism and energy output." (PI: P. Biga), \$25,000, completed |
| 2015 | Center for Teaching & Learning, Teaching Innovation and Development Award. "Using Team Learning and Student-Generated Digital Videos to Increase Student Engagement in STEM." (Co-PI), \$4,092, completed |
| 2014- 2015 | Nutrition Obesity Research Center, UAB, Pilot/Feasibility Grant. Renewal. "Role of amino acids in the epigenetic regulation of muscle growth in determinate and indeterminate growing paradigms." (PI: P. Biga), \$25,000, completed |
| 2013-2014 | Faculty Development Grant, UAB. "The characterization of epigenetic regulation of indeterminate myogenesis and muscle atrophy." (PI: P. Biga), \$7,000, completed |
| 2013-2014 | Nutrition Obesity Research Center, UAB, Pilot Grant. "Role of amino acids in the epigenetic regulation of muscle growth in determinate and indeterminate growing paradigms." (PI: P. Biga), \$25,000, completed |
| 2011-2012 | National Science Foundation/NDSU Advance/FORWARD. "Variation in myostatin promoter sequences within the <i>Salmonidae</i> family demonstrates differential regulation of this anti-growth factor as an adaptive mechanism in regard to stress." (PI: P. Biga), \$30,000, completed |
| 2010 | National Science Foundation/ND EPSCoR, "Novel regulation of muscle satellite cell activation in an indeterminate growth model." (PI: P. Biga), \$30,000, completed |
| 2010 | National Science Foundation/NDSU Advance/FORWARD Travel Grant, (PI: P. Biga), \$1,500, completed |
| 2010-2012 | National Institutes of Health/COBRE, Center for Protease Research, NDSU. "The role of MMPs in myostatin activation in skeletal muscle of obese and non-obese mice in response to high-fat diet." (PI: P. Biga), \$144,000, completed |
| 2010 | National Science Foundation/NDSU Advance/FORWARD Course Release Grant, (\$6,000) |
| 2009 | North Dakota INBRE. Seed Project Funding, NDSU, "The role of myostatin in immune system regulation." (PI: P. Biga), \$5,000, completed |
| 2006 | National Institutes of Health, National Institute of Environmental Health Sciences, Marine and Freshwater Biomedical Sciences Center. Seed Grant, UWM, "Characterization of the giant danio as a metabolic muscle growth model organism: a comparative study between giant danio and mice." (PI: P. Biga), \$15,000, completed |

FELLOWSHIPS

1. EPSCoR Fellowship for outstanding minority (female) scientist in molecular biology. University of Idaho. 2000-2001 \$15,000

PUBLICATIONS (PEER-REVIEWED)

(UNDERLINED INDICATES UNDERGRADUATE STUDENT CONTRIBUTIONS)

Summary:	Total: 36 published + 4 in prep
h-index:	Total: 18
i10-index:	Total: 27
Citations:	Total: 970

1. D.W. Hogg, Reid, A.L., T.L. Dodsworth, Y. Chen, R.M. Reid, M. Xu, M. Husic, **P.R. Biga**, A. Slee, L.T. Buck, D. Barsyte-Lovejoy, M. Locke, and D.A. Lovejoy. 2022. Skeletal muscle metabolism and contraction Skeletal muscle metabolism and contraction performance regulation by teneurin C-terminal-associated peptide-1. *Front. Physiol.* 13:1031264. doi: 10.3389/fphys.2022.1031264
2. Bronikowski, A. M., Meisel, R. P., **Biga, P. R.**, Walters, J. R., Mank, J. E., Larschan, E., Wilkinson, G. S., Valenzuela, N., Conard, A. M., de Magalhães, J. P., Duan, J., Elias, A. E., Gamble, T., Graze, R. M., Gribble, K. E., Kreiling, J. A., and Riddle, N. C. (2021). Sex-specific aging in animals: Perspective and future directions. *Aging Cell*, 00, e13542. <https://doi.org/10.1111/ace1.13542>
3. Reid, R.M., A.L. Reid, D.A. Lovejoy, and **P.R. Biga**. 2021. Teneurin C-Terminal Associated Peptide (TCAP)-3 Increases Metabolic Activity in Zebrafish. *Frontiers in Marine Science*. 7. Doi: 10.3389/fmars.2020.591160
4. Cleveland, B.M., T.D. Leeds, M.J. Picklo, C. Brentesen, J. Frost, and **P.R. Biga**. 2020. Supplementing rainbow trout (*Oncorhynchus mykiss*) broodstock diets with choline and methionine improves growth in offspring. *Journal of the World Aquaculture Society*. 1-16. Doi: 10.1111/jwas.12634
5. Latimer, M.N., R.M. Reid, **P.R. Biga**, and B.M. Cleveland. 2019. Glucose regulates protein turnover and growth-related mechanisms in rainbow trout myogenic precursor cells. *Comp. Biochem. Physiol. A*. 232:91-97. Doi:10.1016/j.cbpa.2019.03.010. PMID30904682
6. Reid, R.M., K.W. Freij, J.C. Maples, and **P.R. Biga**. 2019. Teneurins and teneurins C-terminal associated peptide (TCAP) metabolism: What's known in fish? *Front. Neurosci.* 13:177. Doi:10.3389/fnins.2019.00177. PMID:30890915
7. Latimer, M.N., K.W. Freij, B. Cleveland, and **P.R. Biga**. 2018. Physiological and molecular mechanisms of methionine restriction. *Frontiers in Endocrinology Experimental Endocrinology* doi: 10.3389/fendo.2018.00217. PMID:29780356
8. Reid, R., A. D'Aquila, and **P.R. Biga**. 2018. The validation of a sensitive, non-toxic in vivo metabolic assay applicable across zebrafish life stages. 2018. *Comp. Biochem. Physiol. C. Toxicol. Pharmacol.* 208:29-37. Doi: 10.1016/j.cbpc.2017.11.004. PMID: 29162498
9. Latimer, M., B.M. Cleveland, and **P.R. Biga**. 2018. Dietary Methionine Restriction: Effects on Glucose Tolerance, Lipid Content and micro-RNA composition in the muscle of Rainbow Trout. *Comp. Biochem. Physiol. C. (E-pub)* doi: 10.1016/j.cbpc.2017.10.012 PMID: 29100953
10. Galt, N.J., J.M. Froehlich, S.D. McCormick, and **P.R. Biga**. 2018. A comparative evaluation of crowding stress on muscle HSP90 and myostatin expression in salmonids. *Aquaculture*. 483:141-148. doi: 10.1016/j.aquaculture.2017.10.019 PMID: 27444129
11. **Biga, P.R.**, M.N. Latimer, J.M. Froehlich, J.C. Gabillard, and I. Seiliez. 2017. Distribution of H3K27me3, H3K9me3, and H3K4me3 along autophagy-related genes highly expressed in starved zebrafish myotubes. *Biol. Open* 6(11):1720-1725. PMID: 29025701
12. Latimer, M.N., N. Sabin, A. Le Cam, I. Seiliez, **P. Biga**, and J.C. Gabillard. 2017. miR-210 expression is associated with methionine-induced differentiation of trout satellite cells. *J Exp. Biol.* 220(Pt 16):2932-2938. doi:10.1242/jeb.154484 PMID: 28576820

13. Galt, N.J., S.D. McCormick, J.M. Froehlich, and **P.R. Biga**. 2016. A comparative examination of cortisol effects on muscle myostatin and HSP90 gene expression in salmonids. *General and Comparative Endocrinology*. 237:19-26. doi:10.1016/j.gcen.2016.07.019 PMID: 27444129
14. Seiliez, I., J.M. Froehlich, L. Marandel, J.C. Gabillard, and **P.R. Biga**. 2015. Evolutionary history and epigenetic regulation of the three paralogous *pax7* genes in rainbow trout. *Cell Tissue Research*. 359(3):715-27. Dec. 10. PMID: 25487404
15. Allison DB, Antoine LH, Ballinger SW, Bamman MM, **Biga P**, Darley-Usmar VM, Fisher G, Gohlke JM, Halade GV, Hartman JL, Hunter GR, Messina JL, Nagy TR, Plaisance RP, Roth KA, Sandel MW, Schwartz TS, Smith DL, Sweatt JD, Tollefsbol TO, Watts SA, Yang Y, Zhang J, Austad, S, and Powell ML. 2014. Aging and energetics' 'Top 40' future research opportunities 2010-2013. v1; <http://f1000r.es/4ae>; *F1000Research*, 3:219 (doi:<https://dx.doi.org/10.12688/f1000research.5212.1>)
16. Galt, N.J., J.M. Froehlich, E.A. Remily, S.R. Romero, and **P.R. Biga**. 2014. The effects of exogenous cortisol on myostatin transcription in rainbow trout, *Oncorhynchus mykiss*. *Comp. Biochem. Physiol. A. Mol Intergr. Physiol.* 175:57-63. PMID: 24875565
17. Picha, M.E., **P.R. Biga**, N. Galt, A.S. McGinty, K. Gross, V.S. Hedgepeth, T.D. Siopes, and R.J. Borski. 2014. Overcompensation of circulating and local insulin-like growth factor-I during catch-up growth in hybrid striped bass (*Morone chrysops* X *Morone saxatilis*) following temperature and feeding manipulation. *Aquaculture*. 428-429:174-183
18. Froehlich, J.M., I. Seiliez, J.C. Gabillard, and **P.R. Biga**. 2014. Preparation of Primary Myogenic Precursor Cell/Myoblast Cultures from Basal Vertebrate Lineages. *Journal of Visualized Experiments*. Apr 30;(86). doi:10.3791/51354. PMID: 24835774
19. Goetz, F.W., A. Jasonowicz, R. Johnson, **P. Biga**, G. Fischer, and S. Sitar. 2014. Physiological differences between siscowet and lean trout morphotypes: Are these metabolotypes? *Canadian Journal of Fisheries and Aquatic Sciences*. 71(3):427-435
20. Galt, N.J., J.M. Froehlich, B.M. Meyer, F.T. Barrows, and **P.R. Biga**. 2014. High-fat diet reduces local myostatin-1 paralog expression and alters skeletal muscle lipid content in rainbow trout, *Oncorhynchus mykiss*. *Fish Physiology and Biochemistry*. 40(3):875-86. PMID: 24264425
21. Gabillard, J.C., **P.R. Biga**, P.Y. Rescan, and I. Seiliez. 2013. Revisiting the paradigm of myostatin in vertebrates: insights from fishes. *Gen. Comp. Endocrinol.* 194C:45-54. PMID: 24018114
22. Froehlich, J.M., Z.G. Fowler, N.J. Galt, D.L. Smith Jr., and **P.R. Biga**. 2013. Sarcopenia and piscines: the case for indeterminate-growing fish as unique genetic model organisms in aging and longevity research. *Frontiers of Genetics in Aging*. 4:159. PMID: 23967015
23. Froehlich, J.M., N.J. Galt, M.J. Charging, B.M. Meyer, and **P.R. Biga**. 2013. *In vitro* indeterminate teleost myogenesis appears to be dependent on Pax3. *In vitro Cellular and Developmental Biology-Animal*. 49(5):371-385. PMID: 23613306
24. **Biga, P.R.**, J.M. Froehlich, K.J. Greenlee, N.J. Galt, B.M. Meyer, and D.J. Christensen. 2013. Gelatinases impart susceptibility to high-fat diet induced obesity in mice. *Journal of Nutritional Biochemistry*. 24(8):1462-8. PMID: 23465590 (*work was conducted in my independent lab at NDSU but written at UAB*)
25. Meyer, B.M., J.M. Froehlich, N.J. Galt and **P.R. Biga**. 2013. Inbred strains of zebrafish exhibit variation in growth performance and myostatin expression following fasting. *Comparative Biochem. Physiol. A*. 164(1):1-9. PMID: 23047051 (*work was conducted in my independent lab at NDSU but written at UAB*)
26. Rosauer, D.R., **P.R. Biga**, S. Lindell, F.P. Binkowski, B. Shepherd, C. Simchick, F.W. Goetz. 2011. Development of yellow perch (*Perca flavescens*) broodstocks: physical characteristics after grow-out of different strains of yellow perch. *Aquaculture*. 317:58-66.
27. Lyons, J.A., Haring, J.S., and **Biga, P.R.** 2010. Myostatin expression, lymphocyte population, and potential cytokine production correlate with predisposition to high-fat diet induced obesity in mice. *PLoS One*. 5(9): e12928. PMID: 20877574.

28. **Biga, P.R.** and **J.L. Meyer.** 2009. Growth hormone differentially regulates growth and growth-related gene expression in closely related fish species. *Comp Biochem Phys. A.* 154:465-473. PMID: 19654052.
29. **Biga, P.R.** and F.W. Goetz. 2006. Zebrafish and giant danio as models for muscle growth: Determinate versus indeterminate growth as determined by morphometric analysis. *Am J Physiol: Reg Integ Comp Physiol.* 291:R1327-R1337. PMID: 16741137.
30. **Biga, P.R.**, Roberts S.R., Iliev D.B., McCauley L.A.R., and Goetz F.W. 2005. The isolation, characterization, and expression of a novel GDF11 gene and a second myostatin form in zebrafish, *Danio rerio.* *Comp Biochem Phys. B.* 141:218-230. PMID: 15886039.
31. **Biga, P.R.**, Peterson B.C., Schelling G.T., Hardy R.W., Cain K.D., Overturf K., and Ott T.L. 2005. Bovine growth hormone treatment increased IGF-I in circulation and induced the production of a specific immune response in rainbow trout (*Oncorhynchus mykiss*). *Aquaculture.* 246:437-445.
32. Ettensohn K.M., **Biga P.**, Romano C., Devlin R.H., Roberts S.B. 2004. Genes differentially expressed in growth hormone transgenic salmon. *Biol Bull.* Oct; 207(2):168.
33. **Biga, P.R.**, K.D. Cain, R.W. Hardy, G.T. Schelling, K. Overturf, S.B. Roberts, F.W. Goetz, and T.L. Ott. 2004. Growth hormone differentially regulates myostatin-I and -II and increases circulating cortisol in rainbow trout (*Oncorhynchus mykiss*). *Gen Comp Endocrinol.* 138(1):32-41. PMID: 15242749.
34. Congleton, J.L., **P.R. Biga**, and B.C. Peterson. 2004. Plasma insulin-like growth factor-I in yearling Chinook salmon (*Oncorhynchus tshawytscha*) migrating from the Snake River Basin, USA. *Fish Physiol Biochem.* 29:57-66
35. **Biga, P.R.**, K.D. Cain, R.W. Hardy, K. Overturf, G.T. Schelling, and T.L. Ott. 2004. The effects of recombinant bovine somatotropin (rbST) on tissue IGF-I, IGF-I receptor, and GH mRNA levels in rainbow trout (*Oncorhynchus mykiss*). *Gen Comp Endocrinol.* 135(3):324-333. PMID: 14723884.
36. Peterson, B.C., **P.R. Simpson**, K.D. Cain, R.W. Hardy, G.T. Schelling, and T.L. Ott. 2003. Effects of administration of somatostatin-14 and immunoneutralization of somatostatin on endocrine and growth responses in rainbow trout. *J. Fish Biology.* 63:506-522.

PUBLICATIONS (NON-PEER-REVIEWED)

1. Rexroad III, C. and P.R. Biga, 2021. Aquaculture id Agriculture Colloquium, White Paper, <https://www.usda.gov/topics/farming/aquaculture/aquaculture-agriculture>
2. Morris, S., **P.R. Biga**, and J. Williams. 2021. "Growing Connections Across USDA for Innovation in Food Safety and Nutrition." USDA Research and Science Publication, <https://www.usda.gov/media/blog/2020/12/18/growing-connections-across-usda-innovation-food-safety-and-nutrition>
3. **Biga, P.R.** and C. Rexroad III. 2020. "Serving Savory Seafood for 2020 Holiday Meals." USAD Research and Science Publication, <https://www.usda.gov/media/blog/2020/12/01/serving-savory-seafood-2020-holiday-meals>
4. Small, B., **P.R. Biga**, B. Peterson, and J. Gutierrez. 2019. "Introduction to the XIIIth ICBF conference special issue." *Comp. Biochem Physiol A.* 236: 110519. (Editorial)
5. **Biga, P.R.** 2019. "How health disparities can be reduced through educational gains and improved coordination of community services." Scholars Strategy Network Policy Brief, <https://scholars.org/contribution/how-health-disparities-can-be-reduced-through-educational-gains-and-improved>

PUBLICATIONS (BOOK CHAPTERS, IN REVIEW)

1. Cleveland, B., K. Overturf, **P.R. Biga**. Chapter 14. Nutritional regulation of myogenesis and muscle physiology. Book: Principles of nutrition and Metabolism in Fish and Crustaceans. Publisher: Elsevier; Editor: Vikas Kumar. *In revisions.*

PUBLICATIONS (BOOK CHAPTERS)

1. **Biga, P.R.**, 2009. Muscle Regulation, In: *Current Status of Molecular Research in Aquaculture*. Ed: K. Overturf. Wiley-Blackwell Publishers. ISBN-13: 978-0-8138-1851-1.

PRESENTATIONS AT NATIONAL & INTERNATIONAL MEETINGS (2019-2023)

1. Physiological Insights into Aquaculture, Speaker, "Supplementing rainbow trout broodstock diets with choline and methionine improves offspring growth." Aquaculture Canada and WAS North America 2020 (rescheduled for 2022), August 18, 2022, St. John's, Newfoundland, Canada
2. Stress and Regulation of Appetite Session, Co-Chair & Speaker, "Conserved metabolic and stress regulatory features of teneurin c-terminal associated peptides (TCAP) in fish." International Congress on the Biology of Fishes. (Originally scheduled for June 2020) June 29, 2022, Montpellier, France.
3. Physiological Insights Towards Improved Fish Culture Symposium, 'Methionine Restriction Diminishes Skeletal Muscle Cell Differentiation Through Epigenetic Mechanisms in Rainbow Trout, *Oncorhynchus mykiss*.' World Aquaculture Society, February 2022. San Diego, CA, USA
4. 9th International Society for Fish Endocrinology, 'Conserved metabolic regulatory function of teneurin c-terminal associated peptide (TCAP) in fishes.' June 2020. Guangzhou, China – postponed until September 2022.
5. 5th Biennial North American Society for Comparative Endocrinology, 'Increased metabolic rate by teneurin c-terminal associated peptide (TCAP)-3: A comparative analysis across zebrafish life stages.' May 2019. Gainesville, Florida.
6. World Aquaculture Society, 'Diet-epigenetic interactions regulate muscle proliferation and metabolism in teleosts.' March 2019. New Orleans, Louisiana.
7. International Congress of Fish Biology, 'Starvation-induced changes in histone modification along autophagy-related genes.' July 2018. Calgary, Canada

STUDENT PRESENTATIONS AT NATIONAL & INTERNATIONAL MEETINGS (2019-2023)

1. K. Freij*, S. Turkmen, B. Cleveland, and P.R. Biga. Improving rainbow trout *Oncorhynchus mykiss* growth performance through optimization of diet-epigenetic interactions. Aquaculture America, February 2023, New Orleans, LA USA
2. K. Freij*, S. Turkmen, B. Cleveland, and P.R. Biga. Improving rainbow trout *Oncorhynchus mykiss* growth performance through optimization of diet-epigenetic interactions. World Aquaculture Society, February 2022, San Diego, CA USA
3. K. Freij*, S. Turkmen, B. Cleveland, and P.R. Biga. Improving rainbow trout *Oncorhynchus mykiss* growth performance through optimization of diet-epigenetic interactions. Plant and Animal Genome, 2021, *Virtual*
4. R Reid*, E Velez, MN Latimer, PR Biga. Variable organismal growth potential corresponds to differential growth hormone signaling. North American Society for Comparative Endocrinology Conference, May 25, 2019, Gainesville, FL USA
5. K Freij*, KM Lee, PR Biga. 2B or not 2B: MSTN is the question. North American Society for Comparative Endocrinology Conference, May 25, 2019, Gainesville, FL USA
6. KM Lee*, R Reid, K Freij, PR Biga. Mechano-growth factor: a hypothesis of the evolution and action of the exercise-induced variant of IGF-I. North American Society for Comparative Endocrinology Conference, May 25, 2019, Gainesville, FL USA

INVITED SEMINARS (UNIVERSITY, NON-UAB; 2019-2023)

1. Ohio University, Biology Seminar Series, 'Fishes as powerful models for understanding sex differences in aging.' April 10, 2023
2. Oakland University, Graduate Research Symposium, Keynote Speaker, 'A Journey to Connect Science and Social Justice.' May 2021, *Virtual*.
3. University of Minnesota, Duluth, Featured Speaker for Swenson College of Science & Engineering, College Symposium. 'A Journey to Connect Science and Social Justice.' January 2021, *Virtual*.

UAB SEMINARS (UAB; 2019-2023)

1. UAB Fish User's Meeting, 'Supplementing Rainbow Trout Broodstock Diets with Choline Improves Offspring Performance.' September 21, 2022
2. UAB School of Public Health, Coffee Hour, 'Science Policy at UAB', May 19, 2022.

3. UAB Advocacy for Women in Science and Medicine Conference, Workshop co-lead, 'Advocacy 101: Writing Letters to Representatives', April 29, 2022, *Virtual*.
4. Science Policy Advocacy Initiative (UAB SPAI), 'UAB Science Policy Certificate and Careers', October 2021, *Virtual*.
5. UAB GBS Pathology Seminar, 'A Journey to Connect Science and Social Justice: Science Policy.' March 21, 2021.
6. UAB Career Panel, 'Science Policy Career Opportunities – After Graduate School Options!', March 15, 2021, *Virtual*.
7. UAB STEMO Seminar Series, 'A Journey to Connect Science and Social Justice.' October 2020, *Virtual*.
8. UAB Fish Users Meeting, 'Dietary Effects of Methionine and Choline.' October 2020. *Virtual*.
9. UAB Biology Department Seminar, 'Empowering Scientists to Effectively Engage in the Policy Making Process.' September 2019. *Virtual*.

WORKSHOPS AND OTHER PRESENTATIONS (2019-2023)

1. Alabama Scholars Strategy Network, 'Training Researchers to Inform Policy', Host, UAB Hill Student Center, February 21, 2023
2. "Lunch and Learn" with Alabama Appleseed and Alabama Scholars Strategy Network, Co-Host, Birmingham Zoo, May 23, 2022.
3. Science Policy Writing Workshop, Keynote Speaker, 'Writing Effective and Impactful Science Policy Papers.' Journal of Science Policy and Governance, April 23, 2022, *Virtual*.
4. Aquaculture is Agriculture, Series of 8 Workshops and 1 Readout Workshop, USDA, Co-Host, 2020, <https://www.usda.gov/topics/farming/aquaculture/aquaculture-agriculture>
5. Grand Challenge Climate Change & Pollinator Health, USDA Workshop, Co-Host, 2019

TEACHING PHILOSOPHY & ENGAGEMENT (SUMMARY)

Being a teacher makes one a better scientist, as one must constantly reexamine the fundamentals of their discipline to effectively convey them to students from different intellectual, socio-economic, and cultural backgrounds. Engaging students in a meaningful manner to foster their scientific curiosity and mastery of terms and concepts requires a high level of commitment to maintaining quality of education. I am committed to excellence in education and continuously strive for effectiveness through teaching proficiency and by taking a positive and active role in mentoring. My overall teaching philosophy centers on students being in charge of their learning and holding them accountable, while maintaining a student-centered classroom that caters to critical thinking and engagement of the 'science mind'. To accomplish this, I utilize several pedagogical strategies that provide students with exciting opportunities to be engaged in the course and the material. I also utilize an integrated education approach that bridges science and social learning together to allow students to find their space and see themselves in the science.

I focus my teaching practices on pedagogies with aims to engage students in critical thinking, problem solving, and knowledge building and not only on knowledge gaining. I want my courses to be integrative and engaging and have students asking hypothesis-driven questions about the material by the end of the semester, while also learning the specific topics. To accomplish these aims, I utilize teamwork, project-based modules, and higher-level assessments based on real world problems in each class I teach. Bringing the world into context of scientific courses is paramount to my teaching, as it helps students find a sense of belonging. The following pedagogical practices are built into my courses to enhance student learning: team-based learning, problem-based learning, portfolio-based assessments, creative projects, and specifications grading. Using combinations of these pedagogical practices allow for a more engaging and flexible classroom where all students can feel like they belong. For example, this semester I incorporated a Wikipedia Education Project, where students are working in groups to edit and add sourced content to Wikipedia related to comparative developmental biology. Students were encouraged to think about how they can create content that fills gaps where historically underrepresented minorities exist. This type of project leads to ownership of scientific knowledge and publicly available content, while also highlighting inclusive and diverse knowledge.

To enhance my teaching effectiveness, I engaged in several workshops and training programs since becoming an Associate Professor. As an example, I participated in a STEM Futures Workshop series funded by the NSF and hosted by Arizona State University. As a participant in this workshop series, I worked with a team of colleagues from 3 other institutions to build a program that focuses on what we think the future of STEM education looks like. This centered around inclusive and inter- and trans-disciplinary programs to build changemakers and problem solvers who are socially conscience. This work helped me build the curricula reform we are testing and proposed to NSF for CAS-wide reform to revolutionize STEM education at UAB. I also completed the Inclusive STEM Teaching Project course, and together this work helped inform on how I developed the Science Policy curriculum that is now an active graduate certificate program at UAB.

Additionally, while I was a AAAS Science & Technology Policy Fellow I served on the Federal Coordination in STEM Education sub-committee (FC-STEM) out of the White House, where I served on two Interagency Working Groups: Inclusion in STEM and Transparency & Accountability. This work resulted in several white papers detailing STEM education programs, effective inclusion practices, and the state of the federal STEM workforce. This experience allowed me to learn from STEM educators at all levels who have expertise in inclusive teaching and effective scientific literacy programming. Additionally, I am a UAB Blazer Core Faculty Fellow (class of 2021). This program supports innovative core teaching and course design where training focuses on high-impact and best practices in general education. This training included working with a student consultant (SCOUT) and a peer faculty member (Krista Chambliss) to gain valuable feedback from a resource often not considered. Collectively, these programs have allowed me to enhance my course designs to be more focused on student outcomes while remaining rigorous but engaging.

TEACHING EXPERIENCE

- **BY123 Introductory Biology I (6 semesters, typical enrollment 80-200), 3 credit hours.** *Course highlights:* basic chemistry, cell structure and function, metabolism, genetics, evolution, viruses, bacteria, and protists. The grading model includes points from four in-class exams, online homework assignments in bundles, online quizzes, and laboratory assignments and exams.
- **BY245/555 Fundamentals of Scientific Investigation/Biological Data Interpretation and Analysis (4 semesters, typical enrollment 60-80), 3 credit hours.** *Course highlights:* basics of scientific investigation with an emphasis on understanding what science is, the methods of the scientific process, experimental design, data analysis and interpretation, graphical presentation, and scientific writing. Special emphasis is placed on the understanding of statistical language, the most common types of data analyses used in biology, and the use of R. The grading model includes weekly bundled journal entries and homework assignments, quizzes, and a final cumulative project where the student analyzes a data set and produces a graphical abstract.
- **BY429/491/629 Introduction to Evolutionary Processes (3 semesters, typical enrollment 45-70), 3 credit hours.** *Course highlights:* history of evolutionary thought and modern evolutionary theory. Discussions range from history of life, mechanisms of evolutionary change, sexual selection, adaptation, speciation, and molecular evolution. The grading model includes 3 exams, quizzes, and a paper review. The BY491 section of this course is a capstone course, and includes an ethics module and assessment, as well as a communication project where students create a type of communication to a lay audience on an evolution-related topic. The graduate section (BY629) includes an additional weekly journal assignment.
- **BY475/675 Comparative Developmental Biology (7 semesters, typical enrollment 20-40), 3 credit hours.** *Course highlights:* Mechanisms of development with emphasis on comparative biology. Topics include teratogenesis, endocrine disruptors, developmental origins of disease, developmental models of cancer, modern synthesis in development, evolution through regulation, the environmental interactions, and philosophical concerns in ecological development. The grading model includes bundles of class engagements, reflective journal entries, and content portfolio

assignments (Wikipedia education project). The graduate section (BY675) includes an additional compilation assignment that highlights contemporary issues related to developmental biology.

- **BY495 Science Mentoring Outreach in Biology (1 semester, enrollment 6), 3 credit hours.** *Course highlights:* Topics included training undergraduate and graduate students how to work in public k-8 schools, developing lesson plans for hands on activities, and outlining outreach activities. This course led to the formation of STEMO, a student-led organization that works with Girls, Inc. of Central Alabama to engage k-8 girls in STEM learning.
- **BY617 Science Policy (2 semesters, enrollment ~10), 3 credit hours.** *Course highlights:* Science and technology intersect with multiple areas of public policy. Think of the growing concerns over technological surveillance, the debates over policy for climate change mitigation, the challenges posed due to global health crises, or the fear that American research and development competitiveness is eroding in a globalized economy. These issues reflect important questions about the relationship between science, technology, and public policy. Are scientific and technological developments governable, and if so, how and by whom? Is more and better science always better for policymaking? Who is the best judge of the value of scientific research programs and the validity of scientific findings? Are scientific and technological innovations generally socially beneficial, and who decides? What role should policymakers play in regulating science? The grading model includes bundles of weekly journal entries and class engagements, with a policy brief, memo, and infographic assignments.
- **BY647 Contemporary Political Issues in Science Policy (1 semester – Fall 2022, enrollment 8), 3 credit hours.** *Course highlights:* Our rapidly changing world faces significant, multi-faceted problems at the nexus of technology and society. The response to these socio-scientific issues will impact the future of the human condition. The scientific process has a role to play in finding timely, effective, and evidence-based solutions. This course showcases science as a dynamic and iterative process that includes collecting and connecting observations, making hypotheses based on the current understanding, and constructing models that are revised as new knowledge is acquired. It emphasizes the role of dialogue and communication in shaping responses to socio-scientific issues. The grading model includes bundles of bi-weekly journal entries, class engagements, with a policy brief, and action items for one issue.
- **BY225/PSC225 Contemporary Issues in Science Policy (1 semester – Fall 2023, enrollment 58), 3 credit hours.** *Course highlights:* An introduction to cutting-edge science, medicine, and technology as well as the difficult ethical concerns they raise. This course provides undergraduate students practical training in cross-disciplinary learning while engaging in discourse about difficult, controversial, and critical questions related to science and policy. This course satisfies the Blazer Core “Communicating in the Modern World” credit. The objectives of the course include a student’s ability to understand developing science and identify potential social impacts, provide examples of how science can inform policy, and interpret and explain socio-scientific issues to diverse audiences. The grading model includes weekly quizzes covering weekly reading assignments, current event presentations, and a group project landscape analysis that includes written and presented components.

IDEA RATINGS OF INSTRUCTION 2019-2023

Term	Class	% responded	IDEA Survey Summary Rating (out of 5.0)
F22	BY429/491/629 Evolution	28	4.5
F22	BY647 Cont. Political Issues in Science	83	4.7
Su22	BY245 Biol Data Inter	n/a	n/a
Su22	BY555 Biol Data Inter	n/a	n/a
Su22	BY123 Intro Biology I	23	3.7

S22	BY475/675 Comp Dev Biol	31	4.7
S22	BY617(695) Science Policy	50	4.8
F21	BY123 Intro Biology I	53	3.9
Su21	BY245/555 Biol Data Inter	85	3.8
S21	n/a – professional development leave	n/a	n/a
F20	n/a – professional development leave	n/a	n/a
Su20	n/a – professional development leave	n/a	n/a
S20	n/a – professional development leave	n/a	n/a
F19	n/a – professional development leave	n/a	n/a
Su19	BY245/555 Biol Data Inter	27	3.3
S19	BY245 Biol Data Inter	72	2.9
S19	BY495/695 Science Mentoring	8	n/a

STUDENTS/FELLOWS TRAINED (2019-2023)

S – Spring, Su – Summer, F – Fall

High School Students (total 2019-203 = 2): 1) Emmanuelle LaMontagne, Su22 & Su23, 2) Jacob Knowles, Sp23

Undergraduate Students (2019-2023 = 10; total = 43): 1) Ibukun Tella, F21-present; 2) Timmia Robinson, F21-present; 3) Michelle Diaconu S22-present; 4) Mylah Flowers, Su22-present; 5) Savvy Fanter, F22-present; 6) Benjamin Gregory, F22-present; 7) Sam Lee, Su22; 8) Kanisha Humphrey (Oakwood University) Su21; 9) Damaris Sarabia, Su20-F22; 10) Orielle Caudle, F19, S20, Su20

Graduate Students (2019-2023 = 6; total 10): 1) Lauren Amber Requena, MS, 08/17-04/19 (current position: PhD student UAB Pathobiology); 2) Ross M. Reid, PhD, 08/15-12/20 (current position: postdoctoral researcher, USDA ARS); 3) Khalid Freij, PhD candidate, 08/17-current; 4) Christel Whitehead, PhD student, 08/20-current; 5) Michael Addo, PhD student, 01/22-current; 6) Mason Strickland, PhD student, 01/23-current

Postdoctoral Fellows (total = 2): 1) Serhat Turkmen, Ph.D., 10/19-06/22 (current position: Assistant Researcher, University of Las Palmas de Gran Canaria); 2) Eric Randolph, PhD, 4/23-current

GRADUATE STUDENT THESIS COMMITTEE PARTICIPATION (2019-2023)

- Huixin Wu, Graduate Biomedical Sciences, Mentor: Dr. Trygve Tollefsbol; 2) Heidi Johnson, Department of Biology, Mentor: Dr. Nicole Riddle

GRADUATE AND POST BACHELORETTE STUDENTS AWARDS (2019-2023)

Khalid Freij (Ph.D. Candidate)

- Department of Biology Travel Award, World Aquaculture Society, San Diego, CA, 2022
- North American Society for Comparative Endocrinology Travel Award, 2019

Michael Addo (Ph.D. Student)

- Department of Biology Travel Award, World Aquaculture Society, San Diego, CA, 2022

Christel Whitehead (Ph.D. Student)

- Department of Biology Travel Award, Teaching Professor Conference, New Orleans, LA, 2023

Ross Reid (Ph.D. Awarded 2020)

- North American Society for Comparative Endocrinology Travel Award, 2019
- Ireland travel Scholarship, International Congress on the Biology of Fish, 2018

Keven Lee (Post Bachelorette)

1. North American Society for Comparative Endocrinology Travel Award, 2019

PROGRAMMATIC DEVELOPMENT (2019-2023)

- Designed Graduate Certificate Program in Science Policy in collaboration with Dr. Peter Jones (Assistant Professor, Public Administration and Political Science Department, UAB) - <https://www.uab.edu/cas/biology/graduate/graduate-certificate-in-science-policy>
- Designed course plans for 3 new graduate courses for Science Policy certificate
 - BY617/MPA617 – Science Policy
 - BY647/MPA647 – Contemporary Political Issues in Science Policy
 - BY677 – Design Thinking to Solve Problems through Science Policy
- Designed course plan for 1 Blazer Core course in collaboration with Dr. Rob Blanton (Professor and Chair, Public Administration and Political Science Department, UAB)
 - BY/MPA 225 – Contemporary Political Issues in Science Policy (to be taught Fall 2023)

PROFESSIONAL DEVELOPMENT

1. IISAGE Leadership Academy, UAB COLLAT School of Business, 2023
2. STEM Futures Workshop Series Participant, Arizona State University, 2019-2020
3. American Institute of Biological Sciences Communications and Advocacy Bootcamp, 2021
4. Inclusive Teaching Project Training course, Fall 2021
5. Foundational Open Science Skills training course, CyVerse, Spring 2021
6. Women in Leadership Course, eCornell, October 2020
7. Scholars Strategy Network, National Leadership Convening, Washington, DC January 17-18, 2019
8. Scholars Strategy Network May 2019 – Co-organized luncheon workshop for local scholars and local media outlets. Reporters from AL.com, NPR, APT, Weld, and PARCA attended, alongside 20 UAB and UA scholars/faculty.
9. Scholars Strategy Network – April 2019. Co-organized a writing workshop at DISCo for UAB and UA scholars to work on writing policy briefs. 4 scholars participated and 3 briefs were submitted to SSN.
10. 50th Anniversary White House Conference on Food, Nutrition, and Health, October 3-4, 2019; Freidman School of Nutrition Science and Policy & Harvard TH Chan School of Public Health.
11. Using policy analysis to engage policymakers and inform the public, October 18, 2019, AAAS, Washington, DC.
12. OneHealth Outbreak Exhibit one-on-one at the Natural History Museum. The creator and curator of the Outbreak Exhibit walked the OneHealth Affinity group through the exhibit, kiosk-by-kiosk explaining how the information was compiled and brought together for an exhibit at the NHM.
13. Sensory Nutrition and Disease Workshop, November 12-14, 2019, NIH, Natcher Conference Center.
14. National Academies of Science, Engineering, and Medicine Workshop on Supporting Parents and Caregivers in STEMM, December 2, 2019, National Academy of Sciences Building (Constitution Ave NW), Washington DC.
15. *Biguan*, NORC Grant Writing Retreat, November 2015, Group Mentoring, NSF proposal
16. National Institutes of Aging, Summer Training Course in Experimental Aging Research, ‘Unique muscle regeneration model – indeterminate growing danion’. June 2014. Seattle, WA
17. *Biguan*, NORC Grant Writing Retreat, September 2013, NIH proposal, Mentor: Dr. Lou Dell’Italia
18. Participated in Pedagogical luncheons offered at North Dakota State University, 2007-2010
19. Participated in 1st and 2nd year Teaching Seminars, Dean Kevin McCaul, North Dakota State University, 2007-2009
20. Professional Animal Scientist, Fish Biology, 2002

PUBLICITY (2019-2023)

- 1) Dale Hollow National Fish Hatchery, U.S. Fish and Wildlife Service Highlight: <https://www.fws.gov/story/2023-01/university-alabama-trout-nutrition-and-growth-research-project>
- 2) Scholars Strategy Network, Chapter Highlight: <https://scholars.org/features/chapter-spotlight-alabama-ssn-collaborates-local>
- 3) Association for Women in Science (AWIS), Member Spotlight: <https://www.awis.org/project/dr-peggy-r-biga/>
- 4) STEMO receives a Sigma Xi grant: <https://patch.com/alabama/birmingham-al/minority-students-will-expand-knowledge-science-through-diversity-grant>
- 5) AAAS Science & Technology Policy Fellowship: <https://www.uab.edu/news/research/item/10597-biga-to-advise-chief-scientist-at-the-u-s-department-of-agriculture>

SERVICE STATEMENT

Since becoming an independent scientist, I have aspired to be a public scholar and not just a bench scientist. To me, being a public scholar means to engage the local community in science in a meaningful way. I have operationalized this through the development of a STEM outreach program (now called STEM), the creation and co-leading of the Alabama Scholars Strategy Network Chapter, being awarded a prestigious American Association for the Advancement of Science (AAAS) Science & Technology Policy Fellowship, serving several roles within the UAB Faculty Senate, developing a Science Policy graduate certificate program, and continuing to push for community engagement through our Departmental Darwin Day activities that I started in 2012. My goal is to support training in outreach for our students, while also building a bridge between science and policy in a way that trains more scientists to advocate for and support data-driven policymaking. All my service efforts are meant to promote inclusivity and equitable opportunities through the creation of unique programs that connect scholars with the communities we inhabit.

DEPARTMENT, SCHOOL, & UNIVERSITY SERVICE (2019-2023)

Department of Biology

2023-present	Chair, Graduate Affairs & Curriculum Committee
2021-present	Faculty mentor for Dr. Cindy Tant, UAB Biology Assistant Professor
2020-2023	Graduate Affairs Committee
2020-present	Darwin Day Organization Committee
2018-2019	Biology Facilities Committee Chair
2014-2020	Biology Department Curriculum Committee Member
2014-2020	Biology Department Honors Program Committee Member

College of Arts and Sciences

2021-present	CAS Curriculum & Education Policy Committee (CEPC) Member
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University of Alabama at Birmingham

2023-present	UAB Data Sharing and Management Taskforce
2023-present	UAB IDC Sharing Working Group
2022-present	Chair, Faculty Senate Research Committee
2021-present	Faculty Senate Executive Committee
2022-present	Institutional Biosafety Committee (IBC), Faculty Senate Representative
2021-2023	Faculty Senate, Senator-at-Large
2021-present	Faculty Senator, CAS Representative
2021-present	Goldwater Internal Nominee Selection Committee
2018-present	UAB Sustainability Ambassador
2017-present	Women in STEM, member

PROFESSIONAL SERVICE (2019-2022)

Professional Society Memberships

Genetics Society of American (GSA)

Society for Integrative and Comparative Biology (SICB)
 North American Society for Comparative Endocrinology (NASCE)
 Society for Experimental Biology (SEB)
 American Institute of Biological Sciences (AIBS)
 American Association for the Advancement of Science (AAAS)
 American Fisheries Society, Physiology Section (AFS, PS)
 International Society for Fish Endocrinology (ISFE)
 World Aquaculture Society (WAS)
 Association for Women in Science (AWIS)
 Scholars Strategy Network (SSN)

Professional Society & Meeting Involvement

International Society for Fish Endocrinology, International Science Committee (2019-present)
 Aquatic Animals Models of Human Disease Conference, Host/Organizer 2017, Symposia
 Organizer/Chair 2019, 2021/2022, Scientific Committee 2022-present
 North American Society for Comparative Endocrinology – Symposium Chair, Award Committee (2019-present)
 Scholars Strategy Network, Alabama Chapter Leadership Team (2018-present)
 American Fisheries Society, Physiology Section –Nominated for President-Elect (2014, 2018),
 Symposium Chair (2020, 2022)

Grant Review Committees/Panels

Panelist for USDA AFRI (2x), NSF GRFP (3x), DoD NDEP (1x), WRAC (1x), *ad hoc* reviewer for NSF-
 IOS (regular proposals; total: 3 ad-hoc items since 2019)

Editorial Boards and Journal Peer Review

Journal peer review: Frontiers in Physiology, Frontiers in Endocrinology, Marine Biotechnology, Molecular
 Medicine, Disease Markers, Metabolites, Animals, The Protein Journal, Molecular and Cellular
 Endocrinology, Scientific Reports, Journal of Fish Biology, Journal of Experimental Biology,
 Development, General and Comparative Endocrinology, Journal of Endocrinology, PLoS ONE,
 Aquaculture

Editorial service: Frontiers in Experimental Endocrinology (Review Editor); F1000 (Associate Member);
 Marine Biotechnology (Editorial Board member)

COMMUNITY SERVICE & OUTREACH (2019-2022)

2023- present	Faculty Advisor, HerSTEM, Student organization for STEM education outreach
2019-2023	Faculty Advisor, STEM0, Student organization for STEM education outreach
2018-present	Member, Co-Leader Alabama Chapter, Scholars Strategy Network
2017-2019	Member, Education and Workforce Training Committee, Mayor Randall Woodfin Transition Committee, City of Birmingham
2012-present	Founder, Organizer/Co-organizer, UAB Darwin Day

HONORS & AWARDS

1. Humble Hero Award; City of Birmingham, Division of Youth Services – Youth First Program; Mayor William A. Bell, Sr. and Cedric Sparks, 2017
 2. UAB Department of Biology, Altruism Award, 2017
 3. Nutrition Obesity Research Center, Creativity is a Decision Prize, 'Egg allergy understanding from a different perspective: the hen producing the egg.' 2016
 4. Stop Obesity Challenge Winner, Mid-South Transdisciplinary Collaborative Center for Health Disparities Research, UAB Minority Health and Health Disparities Research Center, 2015
 5. Nutrition Obesity Research Center (NORC, UAB) Named New Investigator, 2013
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